

Prevalence of Traditional and Complementary Alternative Medicine's Use among Cancer Patients in South Peninsular Malaysia

Nurul Huda Razali¹, Aisyah Ali¹, Siew Hua Gan², Chun Sen Lim³

¹Clinical Research Centre Hospital Sultan Ismail, Johor, Malaysia. ²School of Pharmacy, Monash University Malaysia, Bandar Sunway, Selangor, Malaysia. ³Oncology Department Hospital Sultan Ismail, Johor, Malaysia.

Abstract

Objective: This study sought to describe the use of traditional and complementary alternative medicine's (CAM) in a cohort of cancer patients in Johor, a state in Southern Peninsular Malaysia. **Methodology:** This is a four-month cross sectional study, targeted, on cancer outpatient clinics in three hospitals. Ethical approval and signed written informed consents were obtained from the patients, prior to the study. A standardised, interviewer-administered questionnaire was used to obtain the socio-demographic characteristics, clinical characteristics and questions on CAM's use. **Results:** The response rate was 95.4%. The majority of the participants was females (79.9%) and was from the Malay ethnic group (79.2%) with most having only a secondary education (41.8%). The mean age was 57.7 ± 12.47 years with the majority having breast cancer (51.1%). There were no significant association between the socio demographic variables with CAM's use with the exception of hospital, participants' religion and ethnicity (p -value < 0.05). Many patients preferred biologically-based therapies (87.8%) such as herbs and dietary supplements with a large proportion having reported to have utilised CAM after having completed the conventional treatment (40.0%). The majority (60.1%) of the patients were satisfied with CAM treatment while only 17.40% showed dissatisfaction. Most cancer patients chose CAM due to their perceived fewer side effects (31.1%), to increase quality of life (26.7%) and as a curative intent (20.7%). **Conclusion:** There is a high prevalence of CAM's use among cancer patients in Southern State in Malaysia.

Keywords: Cancer- traditional and complementary medicine- Malaysia

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Introduction

Globally, high mortality rates due to cancer have been reported with 20,100 deaths (2008) and 21,700 deaths (2012) [1]. Although many conventional therapies including chemotherapy or radiotherapy have been developed, they pose serious and debilitating adverse effects, which may contribute to non-compliance and/or resistance. As a result, many patients in Malaysia turn to non-traditional means as an alternative. Similarly, in the past years, there is a growing interest in complementary and Alternative Medicine (CAM) in Malaysia which is a multiracial country. CAM is defined as a group of diverse health practices, approaches, knowledge and beliefs incorporating plant, animal and animal-based medicine,

spiritual therapies, manual techniques and exercise which can be applied singularly or in combination to treat, diagnose and prevent illness or maintain the well-being of an individual [2].

A report suggests that there is a high prevalence of CAM's use for cancer amelioration in some developed nations (30% to 90%) [3] with similar prevalence (almost 70%) in developing countries [4-5]. In Malaysia, studies [6-8] have reported that approximately 51 – 88% cancer patients utilise CAM at any one time. Many physicians find CAM's utilisation for cancer, challenging since CAM's practice during conventional treatment may delay or even preclude oncology treatment, causing unwanted drug

Corresponding Author:

Dr. Nurul Huda Razali
Clinical Research Centre Hospital Sultan Ismail, Johor, Malaysia.
Email: nurulhuda razali7@gmail.com

interactions or poor adherence to conventional treatments since many patients believe that CAM's treatment should be first line. In fact, a study revealed that approximately 13% of patients referred for post-surgical cancer treatment rejected all further conventional treatments while another 19% declined one treatment or another due to their strong beliefs in CAM's curatives effects [9].

Therefore, in this study, we explored the prevalence of CAM's use among cancer patients in Malaysia which include differences in CAM's used based on socio demographic and clinical factors, determination of the most common method for CAM's use, the purported reasons for use as well as the biggest factor influencing CAM's utilisation and patient satisfactions. It is hoped that this study can provide a better understanding on the expectation and pattern of CAM's use among Malaysian cancer patients and to identify the limitations of conventional treatment from patients' perspectives. The information gathered can be a good reflection of the preferences of Malaysian ethnicity and cultures to help better understand patients' preferences and for more successful therapies.

Materials and Methods

Study Design

This is a four-month cross-sectional study conducted in three government public hospitals in a southern state in Malaysia. It was a prevalence-based sample consisting of 240 cancer patients attending the oncology and visiting clinics in 1) Sultanah Fatimah Specialist Hospital (HPSF), Muar, 2) Sultanah Nora Ismail Hospital (HSNI), in Batu Pahat and 3) Sultan Ismail Hospital (HSI), Johor Bharu (Figure 1). The inclusion criteria included 1) cancer patients ageing more than 18 years old, with confirmed diagnosis of cancer regardless of tumour type for at least six months prior to the study (but not more than five years post diagnosis) and 2) able to understand the Malay and/or English languages. A convenient sampling method

was applied to obtain the samples. Ethical approval was obtained from the Medical Research Ethics Committee, Ministry of Health, Malaysia which complies with the Declaration of Helsinki.

Questionnaire

The patients were individually approached and written informed consents were obtained prior to conducting the interview and disseminating the questionnaires. A face-to-face interview was conducted by a single researcher dedicated to the study on consenting participants. A standardised, interviewer-administered questionnaire was used to collect the data on the socio-demographic and clinical characteristics, participants' understanding of their own diseases and utilisation of CAM, involving specifically 1) the type of CAM 2) used sources of information regarding CAM used 3) reasons for CAM used and 4) patient's satisfaction on CAM's utilisation.

Data analysis

PASW Statistics® 18 © 2009 Statistical Packages for Social Science (SPSS), version 16.0, IBM Corporation, (New York, USA) was used to analyse all data. Descriptive statistics was used to summarise the data while a Pearson Chi Square test was applied to identify the association among independent variables with CAM's utilisation. A p-value of <0.05 is considered as statistically significant.

Results

Socio-demographic and clinical characteristics

A total of 229 eligible cancer patients from the three different tertiary hospitals offering oncology services in the form of in-house and visiting clinics were involved. The mean age \pm standard deviation of the participants was 57.7 ± 12.47 years. The majority of participants was female (79.9%), Malay (79.2%), Moslem (73.7%) and has secondary level of education (41.8%). The most frequent diagnosis was breast cancer (51.1%). Approximately

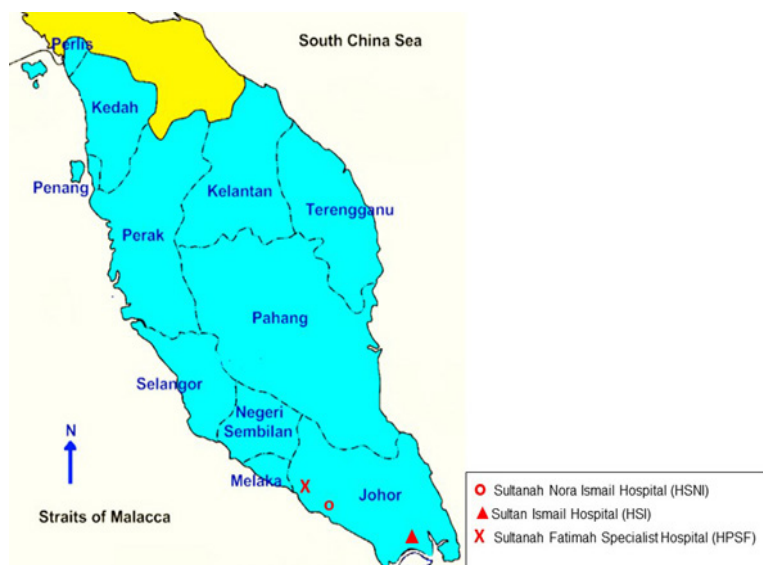


Figure 1. Location of the Three Hospitals in Johor, Peninsular Malaysia

Table 1. Demographic and Clinical Characteristic of the Patients

	Utilisation of CAM		p-value
	Yes (140) n (%)	No (89) n (%)	
Hospital			
HSNI	41 (29.3)	19 (21.3)	0.004 ^b
HSI	57 (40.7)	56 (62.9)	
HPSF	42 (30.0)	14 (15.7)	
Age (years)			
21-40	19 (13.6)	6 (6.7)	0.448 ^c
41-60	61 (43.6)	42 (47.2)	
61-80	57 (40.7)	39 (43.8)	
>80	3 (2.1)	2 (2.2)	
Gender			
Male	31 (22.1)	15 (16.9)	0.330 ^b
Female	109 (77.9)	74 (83.1)	
Level of education			
No schooling	16 (11.5)	18 (21.4)	0.101 ^b
Primary	45 (32.4)	25 (29.8)	
Secondary	57 (41.0)	35 (41.7)	
Higher education	21 (15.0)	6 (7.1)	
Religion			
Islam	114 (81.4)	54 (61.4)	0.001 ^c
Buddhist	19 (13.6)	21 (23.9)	
Christian	2 (1.4)	4 (4.5)	
Hindu	3 (2.1)	6 (6.8)	
^Others	2 (1.4)	3 (3.4)	
Ethnicity			
Malay	113 (80.7)	57 (64.0)	0.003 ^c
Chinese	22 (15.7)	23 (25.8)	
Indian	3 (2.1)	6 (6.8)	
#Others	2 (1.4)	3 (3.4)	
Primary cancer			
Breast	69 (49.3)	48 (53.9)	0.914 ^b
Colorectal	20 (14.3)	13 (14.6)	
Gynaecology	18 (12.9)	9 (10.1)	
Prostate	10 (7.1)	5 (5.6)	
Lung	8 (5.7)	3 (3.4)	
Others	15 (10.7)	11 (12.4)	
Stage of cancer			
1	7 (6.2)	5 (6.3)	0.770 ^b
2	23 (20.4)	19 (24.1)	
3	30 (26.5)	24 (30.4)	
4	53 (46.9)	31 (39.2)	
Treatment			
No Treatment	2 (1.5)	0 (0.0)	0.932 ^b
Surgery	18 (13.2)	10 (11.6)	
Chemotherapy	19 (14.0)	14 (16.3)	
Radiotherapy	3 (2.2)	1 (1.2)	
Surgery and chemotherapy	42 (30.9)	30 (34.9)	
Chemotherapy and radiotherapy	7 (5.1)	3 (3.5)	
Surgery, chemotherapy and radiotherapy	40 (29.4)	23 (26.7)	
Other Combinations	5 (3.7)	5 (5.8)	

a, Not all frequencies add up to 230 subjects, as there were some missing data; b, Pearson Chi Square Test, significant with p-value < 0.05; c, Fisher Exact Test, significant with p-value < 0.05; HSNI, Hospital Sultanah Nora Ismail; HPSF, Hospital Pakar Sultanah Fatimah; HIS, Hospital Sultan Ismail; ^Others, Confucious, atheists and unknown; #Others, Aborigines and unknown

Table 2. CAM's Utilisation

Variables	Categories	N (%)
Type of CAM's use	Alternative Medical System (AMS)	2 (1.43)
	Biologically Based Therapies (BBT)	123 (88.49)
	Mind-Body Interventions (MBI)	11 (7.91)
	Manipulation and Body-based method (MBM)	3 (2.16)
When CAM was used	Before treatment	46 (34.60)
	After treatment	61 (45.90)
	Concurrent with modern treatment	26 (19.50)

43.8% of participants were in advanced cancer stage at the time of interview. In addition, the majority of patients have undergone either surgery or chemotherapy (32.4%).

Use of CAM

Based on the 229 participants recruited, the majority (62.0%) had used CAM at any point of their disease to treat their condition. Participants from HSI showed the highest percentage of CAM use (40.7%), followed by HPSF (30.0%) and HSNI (29.3%) (Table 1). The majority (80.7%) of CAM user was Malays although Johor consists of only 58.8% Malays (10). Among all the demographic variables, CAM's utilisation was significantly associated with hospital type ($p=0.004$), patients religion ($p=0.001$) and ethnicity ($p=0.003$).

Type and time of CAM use by study participant

Biological-based therapies such as herbs and dietary supplements (87.9%) were the most frequent type of CAM used by the patients (Table 2). The majority (45.9%) of patients commenced CAM after completion of cancer treatments (Table 2). More than 50% of patients from all three hospitals reported were more likely to use CAM after they completed their treatments. HIS patients, on the

other hand has the highest tendency (41.1%) to use CAM before conventional treatments were instituted ($p=0.002$).

Factors influencing CAM's use and its satisfaction

Most patients chose CAM as they are believed to have fewer side effects (31.1%) as opposed to conventional treatments, can increase the quality of life (26.7%) and even cure cancer (20.7%). Others believed that CAM has multiple roles in treating cancer (17.8%) (Table 3). Most patients heard about CAM from friends (37.9%), family (15.0%) and the internet (5.7%). However, a large number of patients heard about CAM from two or more sources (32.1%) while most (75.4%) were influenced by either family or friends who were also using CAM (Table 3). The majority (60.1%) were satisfied with CAM with only a mere 17.4% reported not being satisfied with CAM's use (Table 3).

Discussion

To our knowledge, this is one of the first few studies to report on CAM's practises for amelioration cancer in Malaysia. Similar to other reported prevalence (14-62%) in Malaysia [8, 11-12], more than 50% of the investigated

Table 3. Factors Related to Cancer Patients Used TCM

Variables	Categories	N (%)
Sources of information on CAM	Friends	53 (37.90)
	Family	21 (15.00)
	Advertisement	5 (3.60)
	Internet	8 (5.70)
	Own belief	5 (3.60)
	Newspaper	1 (0.70)
	More than one of the above	45 (32.10)
	Other reasons	2 (1.40)
Reason for using CAM	Perceived to have fewer side effects	42 (31.10)
	To increase quality of life	36 (26.70)
	Curative intent	28 (20.70)
	Not keen on conventional treatment	3 (2.00)
	Afraid to go to hospitals	1 (1.00)
	Multiple roles	24 (17.80)
Satisfaction towards CAM's use	Satisfied	83 (60.10)
	Not satisfied	24 (17.40)
	Neutral	31 (22.50)

cancer patients had utilised some forms of CAM or other sometime in their lives since their first diagnosis. The prevalence is comparable with that reported in other Asian countries including Indonesia (75%), Korea (67%), Thailand (61%) and Singapore (55%) indicating that CAM's use is popular in Asian countries.

Based on our findings, females tend to use CAM more than males which are similar with that reported in several previous studies [8-13]. Nevertheless, the finding may be gender-biased due to the high prevalence of breast cancer cases seen. Although breast cancer tend to be more common in the younger age groups in Malaysia (69.9% in the 2-40 years age category) [14], in this study, those in the older age groups (between 40 and 80 years old) tend to use CAM. McLaughlin (2012) reported that the higher prevalence of CAM's use in the older age group is attributed by a "push" factor which include dissatisfaction with conventional health services and a "pull factor" that are related to positive traits of selection and self-care. Additionally, several studies have reported that a higher level of education and the female gender affect the preponderance towards CAM utilisation among cancer patients [15-16].

Ethnicity was significantly associated with CAM's use in the current study where similar to the study reported by Farooqui et al. (2016) and Zulkipli et al (2018), the Malay ethnicity to be amongst the highest user of CAM for cancer [8-17]. The finding is not surprising since it has been reported that in Malaysia, herbal medicines use are based on practical experiences, observations, and rituals derived from socio-religious beliefs passed from one generation to another [18] where the Malays are seen to have the strongest traditional beliefs. Moreover, although more and more patients tend to seek treatment in hospitals due to better access to the health care system, many of the Malays still have strong beliefs and practice that natural sources like plants and herbs have some healing properties and are not only as effective as conventional means but is also safer than conventional methods [19]. In fact, herbal medicine products which consist of either raw or processed elements from one or more medical plants, are always thought as healthy source of treatment by the Malay population [20]. Herbs like *clinacanthus nutans* ("sabah snake grass" or local name: belalai gajah), *strobilanthes crispus* (local name: pecah beling) and *morinda citrifolia* (local name: mengkudu) which are also easily planted and grow very fast in the tropical climate is widely available in almost every state in Malaysia and has been widely used not only to prevent many types of diseases but also as curative [21]. "Belalai Gajah" or its scientific name *Clinacanthus nutans* is a medicinal plant that is abundant and is readily available in many tropical countries including Thailand and Malaysia. It is widely used for many medicinal properties including antiviral [22], anti-inflammatory [23] and anti-hyperlipidaemic effects [24]. A study conducted by Teoh (2017) reported that the plant have some anti-cancer properties towards selective cancer cells by promoting apoptosis of cancer cells [25]. Although many manufacturers claim that it has some anti-cancer properties, to the best of our knowledge,

no randomised controlled trials (RCTs) or quasi-RCT studies have been conducted to support the said claim.

Our study indicated that the highest CAM user were breast cancer patients followed by gynaecology and colorectal cancer patients. Again, the statistics corresponds with the type of cancer commonly affecting the female gender. Nevertheless, the association seen may be contributed by the fact that breast cancer is also among the top killer disease among Malaysian females [26-27]. Similar finding was also reported by Ezeome (2007), in which the distribution of cancer represented the typical spectrum of patients usually seen in oncology clinics that included breast and colorectal cancers [15]. Not surprisingly, CAM's use was highest among patients with advanced disease although the difference seen was statistically significant with age group but was not statistically significant in this study. It has been reported in the current study that patients who are at terminal stages are often desperate to survive and may try every possible methods available to combat their diseases [28].

Many studies reported that herbs, vitamins and health supplements are among the major treatment modalities among cancer patients. Overall, we have utilised the classification by the National Centre for Complementary and Alternative Medicine [29] in which CAM's practice is categorise into five groups. The first group is a whole medical system such as homeopathic, neuropathic medicine, and traditional Chinese medicines as well as herbs, yoga, massage, acupuncture and ayurveda. The second group is Mind Body Medicine such as patient support groups, cognitive-behaviour therapy, meditation, prayer, mental healing and therapies which utilises creative outlets including art, music or dance, while the third group is Biological-Based Practice such as herbs, food, vitamins and dietary supplements. The fourth group was Manipulative and Body Practice such as osteopathic manipulation, chiropractic medicine and naturopathy while the fifth group was Energy Medicine including bio-filled therapies, tai-chi, chi-qong, reiki and therapeutic touch. Similar to mostly reported studies across Asia and Europe, our patients tend to choose Biologically-Based Therapy as their favourite treatment modalities where two types of herb and a health supplement are frequently used.

Although it is unknown why there is a tendency towards Biological Based Practice among our patents, many patients believed that CAM generally can improve the quality of life with some patients even hoping that it could lead to a cure. The reason was similar in other studies which reported that many cancer patients believed CAM can improve quality of life by boosting the immune system and reducing the side effects of prescribed medications besides acting against cancers [30-35]. In addition, several studies have shown that cancer patients utilise CAM to alleviate their symptoms and relieve pain [36-37]. Although different types of herbs and multivitamins are popular choices among Asian and European patients, prayer and religious healing is the second most common modalities practised among our patients, which can be attributed to cultural and demographic influence which are strongly embedded in certain ethnic groups in Malaysia.

The pattern of CAM use among cancer patients has been a debate in recent years. Although many studies expressed concerns on using CAM for fear of interaction with conventional treatment, only several studies related CAM's use with the delay in initiating oncology treatment. A study conducted by Raja Lexshimi (2013) reported that 64% patients had utilised CAM before using any conventional treatment, 53% combined the use of CAM with conventional treatment while 98% continued to use CAM following completion of conventional treatment [38]. In our study, only 40% of patients utilised CAM after have completed their treatments, especially those in the advanced stage of their cancers with the belief that CAM pose fewer side effects and help to increase the quality of lives. Approximately 25% of the patients used CAM in combination with conventional medicine, which was very much lower than the study conducted by Al-Naggar also in Malaysia (2013) (at 85.5%) [36].

Physicians should be informed of CAM's used since unreported CAM's use may result in drug-drug interaction with either chemotherapy, targeted therapy and/or radiotherapy [39]. Mohd Mujar (2017) reported that CAM's use during conventional treatment has some influence to a certain extend on the non-adherence to conventional treatment [12]. They also pointed out that 35% delayed getting conventional treatment due to their trust on CAM's practices. Although our study reported similar figure (approximately 33% had used CAM after diagnosis, before treatment commencement), the time for initiation of conventional treatment may be delayed due to CAM's dependence. In fact, many patients expressed their reluctance to seek conventional treatment for fear of adverse effects, right after cancer diagnoses as the main cause of the delay seen.

As reported in many studies, friends and family members were the commonest source of information on CAM since this group of individuals are the closest to the patient and may therefore have the most influence on patient's decision making towards their treatments. Additionally, beliefs towards CAM's effectiveness strengthen the claims made by family members who may also have past prior experience of using CAM for many types of diseases on the other hand. Some patients relied on mass media and the internet for further information. The act may pose some risk since some websites may promote CAM without proper verification on the safety and efficacy data to increase their sales thus exposing patients to possible adverse event [40]. Due to this reason, physician plays important roles in conveying the right information about CAM's use and its possible role in cancer or conventional treatment although this fact was not explored in our study.

It has been reported that satisfaction tend to occur because when expectations were met [11]. Similar to the findings of other previous studies conducted in Malaysia [11-36] the majority of the patients were satisfied with CAM's use. Disappointment towards CAM's use is reported to be higher among Nigerian cancer patients, since the majority of the users from this country use them to cure cancer with ultimately unmet expectation [15] and

some treatments offer some psychological satisfaction.

Overall, there is a higher prevalence of CAM users among cancer patients in HSI, which is situated in the capital of Johor in Johor Bahru which is one of the highest contributor to the GDP of Malaysia. Furthermore, HIS is an oncology-centred hospital with specialised oncology facilities and have experienced personnel at hand who may provide some advice on CAM as well as counselling. HSI is one of the Malaysia government hospitals, which provide not only conventional treatment but CAM services such as acupuncture, herbal treatment and massage as an adjunct therapy for cancer patients, which may have contributed to the higher preponderance towards CAM's utilisation seen. Recently, the Malaysian government has recently acknowledged the role of CAM in cancer treatment and has integrated herbal therapies within the government's healthcare system in some hospitals [41-42]. Such an integrated scheme indicates that a combination of CAM with conventional treatment is generally viewed as forthcoming in modern therapies [41].

Our study has some limitations. The convenient sampling method coupled with face-to-face interview may expose the patients to a selection bias where since our researchers were mostly Malay, other ethnic groups including the Chinese and Indians who may not be well versed in the language may have declined their participations due to some language barriers. In some occasions, the face-to-face interview may make participants uncomfortable to disclose certain information for fear of having a negative perception. In this study, although we reported some reasons for CAM use, since the focus was on three major government hospitals based in the urban area, it is unclear if similar findings will be yielded from patients coming from the rural areas. Further studies should explore on the perception of CAM's use among health professionals including doctors and nurses since the government has started establishing some registered CAM practices in some of the hospitals.

In conclusion, our study indicated that CAM is a popular alternative to conventional treatment among cancer patients admitted to the government hospitals in southern region of Malaysia. This is especially more among stage 4 cancer patients when patients have completed treatments with no further treatment options available. It is surprising to note however that many patients from a more urban site with greater facilities and specialities had a greater tendency to delay their treatment due CAM use. Although there were no data about the causes, it is hypothesized that the debilitating side effects of chemotherapy as well as influence from family members and friends may play important roles to this decision. Therefore, patient education is important where physicians should be informed on CAM's utilisation.

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References

1. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *International journal of cancer*. 2015;136(5):E359-86.
2. WHO a. General guidelines for methodologies on research and evaluation of traditional medicine. WHO/EDM/TRM/2000.1. 2000.
3. Adams J, Sibbritt D, Broom A, Loxton D, Pirotta M, Humphreys J, et al. A comparison of complementary and alternative medicine users and use across geographical areas: a national survey of 1,427 women. *BMC complementary and alternative medicine*. 2011;11:85.
4. Yekta Z, Zamani A, Mehdizade M, Farajzadegan Z. Pattern of complementary and alternative medicine use in urban population. *Journal of research in health sciences*. 2007;7(1):24-31.
5. Limsatchapanich S SJ, Nicharojana LO (2013) Factors related to the use of complementary and alternative medicine among people living with HIV/AIDS in Bangkok, Thailand. *Health Science Journal*. 2013;7:436-46.
6. Abuduli M EW, Aljunid S. Role of traditional and complementary medicine in universal coverage. *Malaysian Journal of Public Health Medicine*. 2011;11:1-5.
7. Lua PL. The role of complementary indigenous Malay therapies: perspectives from palliative care patients. *Journal of complementary & integrative medicine*. 2011;8.
8. Farooqui M, Hassali MA, Shatar AK, Farooqui MA, Saleem F, Haq NU, et al. Use of complementary and alternative medicines among Malaysian cancer patients: A descriptive study. *Journal of traditional and complementary medicine*. 2016;6(4):321-6.
9. Simmons K, Lindsay S. Psychological influences on acceptance of postsurgical treatment in cancer patients. *Journal of psychosomatic research*. 2001;51(1):355-60.
10. https://www.citypopulation.de/en/malaysia/admin/01_johor/ (accessed on 13th Jan 2020). [
11. Dhanoa A, Yong TL, Yeap SJ, Lee IS, Singh VA. Complementary and alternative medicine use amongst Malaysian orthopaedic oncology patients. *BMC complementary and alternative medicine*. 2014;14:404.
12. Mohd Mujar NM, Dahlui M, Emran NA, Abdul Hadi I, Wai YY, Arulanantham S, et al. Complementary and alternative medicine (CAM) use and delays in presentation and diagnosis of breast cancer patients in public hospitals in Malaysia. *PloS one*. 2017;12(4):e0176394.
13. Rakovitch E, Pignol JP, Chartier C, Ezer M, Verma S, Dranitsaris G, et al. Complementary and alternative medicine use is associated with an increased perception of breast cancer risk and death. *Breast cancer research and treatment*. 2005;90(2):139-48.
14. Lee MS, Azmiyaty Amar Ma' Ruf C, Nadhirah Izhar DP, Nafisah Ishak S, Wan Jamaluddin WS, Ya'acob SNM, et al. Awareness on breast cancer screening in Malaysia: a cross sectional study. *BioMedicine*. 2019;9(3):18.
15. Ezeome ER, Anarado AN. Use of complementary and alternative medicine by cancer patients at the University of Nigeria Teaching Hospital, Enugu, Nigeria. *BMC complementary and alternative medicine*. 2007;7:28.
16. Moschen R, Kemmler G, Schweigkofler H, Holzner B, Dunser M, Richter R, et al. Use of alternative/complementary therapy in breast cancer patients--a psychological perspective. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*. 2001;9(4):267-74.
17. Zulkipli AF, Islam T, Mohd Taib NA, Dahlui M, Bhoo-Pathy N, Al-Sadat N, et al. Use of Complementary and Alternative Medicine Among Newly Diagnosed Breast Cancer Patients in Malaysia: An Early Report From the MyBCC Study. *Integrative cancer therapies*. 2018;17(2):312-21.
18. Kim Sooi L, Lean Keng S. Herbal Medicines: Malaysian Women's Knowledge and Practice. *Evidence-based complementary and alternative medicine : eCAM*. 2013;2013:438139.
19. Wan Farzana Fasya WH VD, Nurul AA, et al The use of traditional malay massage and traditional malay herbs in Malaysia: A Review *International Journal of Public Health and Clinical Sciences*. 2017;4:24-37.
20. Adnan NON. The Relationship between Plants and the Malay Culture. *Procedia - Social and Behavioral Sciences*2012.
21. Ong HC AN, Milow P. Traditional medicinal plants used by the Temuan villagers in Kampung Tering, Negeri Sembilan, Malaysia. . 2011.
22. Jayavasu C BK, Sangkitporn S, Bunjob M, Chavalittumrong P Clinical trial in the treatment of genital herpes patients with *Clinacanthus nutans* extract. *Com Dis J*; 1992.
23. Wanikiat P, Panthong A, Sujayanon P, Yoosook C, Rossi AG, Reutrakul V. The anti-inflammatory effects and the inhibition of neutrophil responsiveness by *Barleria lupulina* and *Clinacanthus nutans* extracts. *Journal of ethnopharmacology*. 2008;116(2):234-44.
24. Sarega N, Imam MU, Esa NM, Zawawi N, Ismail M. Effects of phenolic-rich extracts of *Clinacanthus nutans* on high fat and high cholesterol diet-induced insulin resistance. *BMC complementary and alternative medicine*. 2016;16:88.
25. Teoh PL, Cheng AY, Liao M, Lem FF, Kaling GP, Chua FN, et al. Chemical composition and cytotoxic properties of *Clinacanthus nutans* root extracts. *Pharmaceutical biology*. 2017;55(1):394-401.
26. Dahlui M, Ramli S, Bulgiba AM. Breast cancer prevention and control programs in Malaysia. *Asian Pacific journal of cancer prevention : APJCP*. 2011;12(6):1631-4.
27. Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global cancer statistics. *CA: a cancer journal for clinicians*. 2011;61(2):69-90.
28. Shen J, Andersen R, Albert PS, Wenger N, Glaspy J, Cole M, et al. Use of complementary/alternative therapies by women with advanced-stage breast cancer. *BMC complementary and alternative medicine*. 2002;2:8.
29. National Centre for Complementary and Alternative Medicine. Complementary, alternative, or integrative health: what's in a name? Available from:<https://nccih.nih.gov/health/integrative-health>. Accessed November 2019 [
30. Ali-Shtayeh MS, Jamous RM, Jamous RM. Herbal preparation use by patients suffering from cancer in Palestine. *Complementary therapies in clinical practice*. 2011;17(4):235-40.
31. Molassiotis A, Scott JA, Kearney N, Pud D, Magri M, Selvekerova S, et al. Complementary and alternative medicine use in breast cancer patients in Europe. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*. 2006;14(3):260-7.
32. Harris P, Finlay IG, Cook A, Thomas KJ, Hood K. Complementary and alternative medicine use by patients with cancer in Wales: a cross sectional survey. *Complementary therapies in medicine*. 2003;11(4):249-53.
33. Montazeri A, Sajadian A, Ebrahimi M, Haghghat S, Harirchi I. Factors predicting the use of complementary and

- alternative therapies among cancer patients in Iran. *European journal of cancer care*. 2007;16(2):144-9.
34. Horneber M, Bueschel G, Dennert G, Less D, Ritter E, Zwahlen M. How many cancer patients use complementary and alternative medicine: a systematic review and metaanalysis. *Integrative cancer therapies*. 2012;11(3):187-203.
 35. Shaharudin SH, Sulaiman S, Emran NA, Shahril MR, Hussain SN. The use of complementary and alternative medicine among Malay breast cancer survivors. *Alternative therapies in health and medicine*. 2011;17(1):50-6.
 36. Al-Naggar RA BY, Abdulghani M, et al Complementary/alternative medicine use among cancer patients in Malaysia. *World J Med Sci*. 2013(8):157-64.
 37. Hwang JH, Kim WY, Ahmed M, Choi S, Kim J, Han DW. The Use of Complementary and Alternative Medicine by Korean Breast Cancer Women: Is It Associated with Severity of Symptoms? *Evidence-based complementary and alternative medicine : eCAM*. 2015;2015:182475.
 38. Raja Lexshimi RG ON, Ho SE, Zuraida J, Zulkifli SZ Complementary and alternative medicine use among breast cancer patients in a tertiary hospital Malaysia. *Malaysian Journal of Public Health Medicine*. 2013;13:11-9.
 39. Gupta M, Shafiq N, Kumari S, Pandhi P. Patterns and perceptions of complementary and alternative medicine (CAM) among leukaemia patients visiting haematology clinic of a north Indian tertiary care hospital. *Pharmacoepidemiology and drug safety*. 2002;11(8):671-6.
 40. Schmidt K, Ernst E. Assessing websites on complementary and alternative medicine for cancer. *Annals of oncology: official journal of the European Society for Medical Oncology*. 2004;15(5):733-42.
 41. Loke MM CK, Zakaria NS & Yusof HM Use of chinese herbal medicine and health-related quality of life among cancer patients in Johor, Malaysia. *Mal J Nutr*. 2017;23:227-38.
 42. Maimunah AH SS, Aidatul Azura AR, et al Traditional and Complementary Medicine Programme in Malaysia Traditional and Complementary Medicine Division Ministry of Health Malaysia, Kuala Lumpur; 2011.



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